

Canon

Interface Unit D.M.B.



E

INSTRUCTIONS
English Edition

The Canon Interface Unit D.M.B. was developed for exclusive use with the Canon Data Memory Back 90 — it is a device which relays communications between the Data Memory Back and an MSX personal computer.

The following programs are built into the unit:

1. Allowing MSX computers to read exposure data stored in the Data Memory Back 90.
2. Printing out all data when an MSX printer is connected.
3. Manually setting the data or releasing the shutter with the keyboard of the MSX computer.
4. Storing all data on a cassette tape or loading the stored data when an ordinary cassette tape recorder is connected.

Moreover, with the tape software accessory you can control the camera in various timer modes or input exposure data into the MSX computer.

Use an MSX personal computer of more than 16 K-bytes with the Interface Unit D.M.B. We recommend the Canon V10 or V20 with the MSX-system, and Canon V25 or V30F with the MSX2-system.

For further information about the MSX personal computer or printer, please contact an authorized Canon Service Facility.

This instruction booklet is written assuming that the Interface Unit D.M.B. is connected to an MSX computer for international use. However, the display may differ with computers in different markets.

Contacts of cables

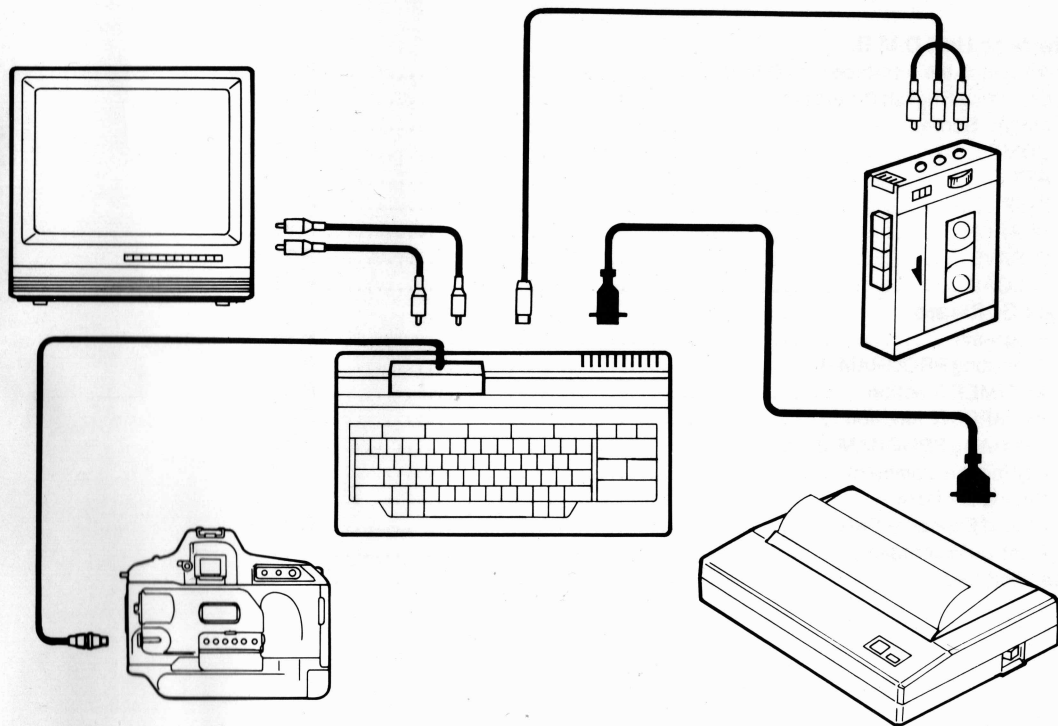


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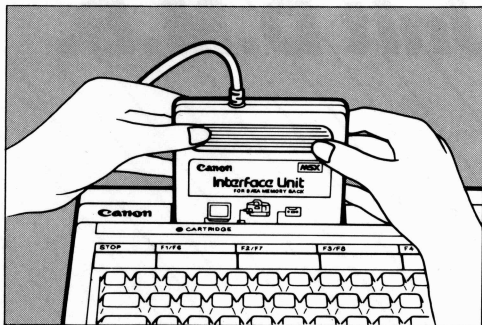
Interface Unit D.M.B.

1. Attaching the Interface Unit D.M.B.

For information about connecting the monitor, printer or cassette recorder to the MSX computer, refer to each instruction book.

Attachment

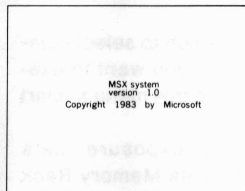
1. Make sure that the main switch of the MSX computer is off.
2. Insert the cartridge of the Interface Unit D.M.B. into the slot of the MSX computer as shown.
3. Remove the cap from the Interface Unit connection terminal of the Data Memory Back 90, and insert the plug into the terminal.



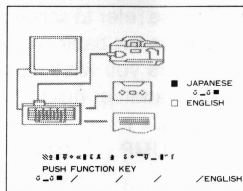
Notes:

- Never insert or remove the Interface Unit while the computer's power is on. Doing so may damage the program, element or the computer itself.
- Do not open the slot by hand.
- Put the cap back on the connection terminal when the Interface Unit is not connected to the Data Memory Back.

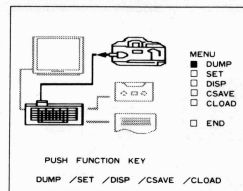
2. Choosing English Program



Screen 1



Screen 2



Screen 3

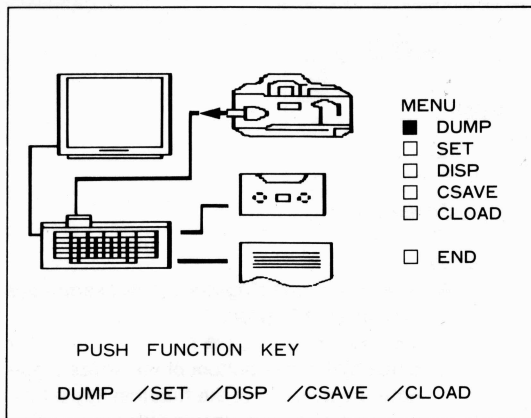
Before executing operational commands on Interface Unit D.M.B., set the message language to English:

1. Turn on the main switches of both the MSX computer and the monitor.
2. After the opening message appears (screen 1), screen 2 is displayed.
3. The message "PUSH FUNCTION KEY" appears; push function key 5 (abbreviated as F5) to select English. Screen 3 (MENU screen) appears.

Notes:

- After choosing English, all messages are displayed in English.
- The symbols  / / / / / ENGLISH at the bottom of the screen indicate the position of the function keys. Program selection is also possible with some screens (e.g. screen 2) by moving the cursor and pushing **RETURN**.
- To stop program execution push **CTRL** and **STOP** at the same time. (Except during DUMP, SET, DISP and SEARCH programs.)

3.MENU Screen



Screen 4

Please refer to screen 4.

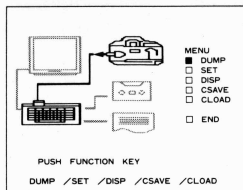
This is the basic menu from which to select commands you wish to execute. If you want to execute another program, return to this menu to start again.

- 1) DUMPtransmits the exposure data stored in the Data Memory Back 90 to the MSX computer.
- 2) SET
 1. IMPRINT — sets a 6-digit number to be imprinted on the film. Shutter release is also possible by pushing the key.
 2. LENS — sets the four kinds of lens data to be stored in the Data Memory Back 90. This command will not work unless the DUMP command has been executed.
- 3) DISP..... displays the data for six frames, transmitted from the Data Memory Back 90 under the DUMP command, on the screen. This command will not work unless you have first performed DUMP. With this command, the exposure data that the MSX computer read from the cassette tape under CLOAD can also be displayed.

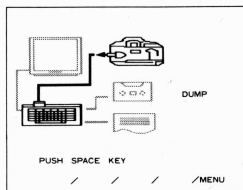
- 4) CSAVE ... saves exposure data transferred from the Data Memory Back 90 to the MSX personal computer under DUMP command on a cassette tape.
- 5) CLOAD ... loads the data stored on a cassette tape.
- 6) END stops the Interface Unit program. To execute the basic program or to load the Tape Software program, also use this command.

To select command 1) — 5), you can use either the function keys or the cursor. However, in the case of END command, you can execute it only by moving the cursor and pushing **RETURN**.

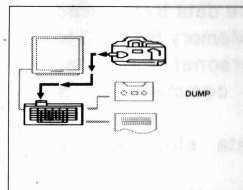
4. DUMP



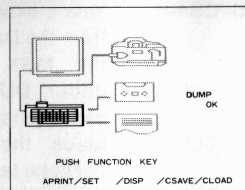
Screen 5



Screen 6



Screen 7



Screen 8

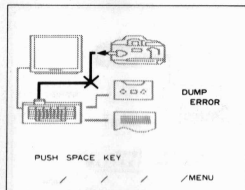
DUMP is the command to transmit exposure data stored in the Data Memory Back 90 to the MSX personal computer.

Transmitting data with the DUMP command is basic to all operations.

The DUMP command will not work unless data is stored in the Data Memory Back 90. When operating the Interface Unit D.M.B. for the first time, we recommend loading the T90 with film and practicing with the Data Memory Back 90 attached.

1. Push the F1 key on the MENU screen (screen 5) to select the DUMP command, and screen 6 appears.
2. Push the space key as indicated on the screen to execute the DUMP command. "←" will appear on the screen while the DUMP command is being executed (screen 7).
3. The message "DUMP OK" appears on screen 8, when DUMP has finished.

If the DISP command is selected with the F3 key on screen 8, the exposure data for 6 frames will be displayed on the screen. For further information about the commands of this screen, see page 16.



Screen 9

NO.	FR	TV	AV	DATE	TIME	METER
						-ING
0061	6 >	1000	3.5	85/10/25	10:40	AVER
0062	2	1000	4.5	85/10/25	10:45	AVER
0063	3	250	5.6	85/10/25	11:30	AVER
0064	4	500	4.0	85/10/25	12:21	AVER
0065	5	250	4.5	85/10/25	12:23	AVER
0066	6	30	2.0	85/10/25	19:15	SPOT

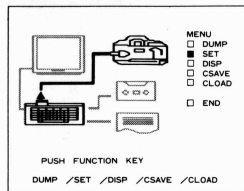
DPRINT /APRINT /SEARCH /1 FR /MENU

Screen 10

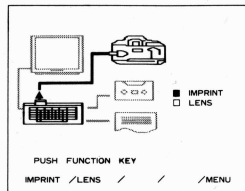
Notes:

- If a transmission error occurs due to the cable connecting the Data Memory Back 90 and the Interface Unit D.M.B. being disconnected or broken, an X will appear as in screen 9. Check the connection cable, then press the space key again to execute the DUMP command once more. Screen 8 will appear when the DUMP command has been completed properly.
- When executing the DUMP command, the data stored in the Data Memory Back 90 is all transferred. However, repeating DUMP is possible before shutter release, to store the new exposure data. In this case, 6 > will appear instead of the first frame number when the DISP command is executed, as shown in screen 10.
- During DUMPing, do not release the shutter nor press any key of the keyboard, or an error may result.

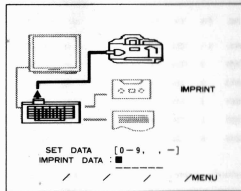
5.SET



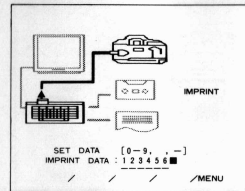
Screen 11



Screen 12



Screen 13



Screen 14

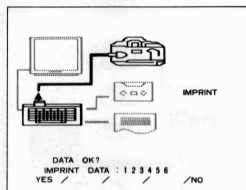
Push the F2 key on the MENU screen (screen 11) to select the SET command, and screen 12 appears.

In this command the IMPRINT or LENS sub-command is accessible.

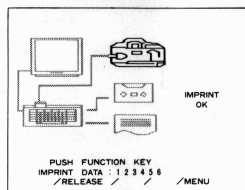
(A) IMPRINT: setting the data to imprint

With this command you can imprint on the film the 6-digit data you desire using the character keys of the keyboard.

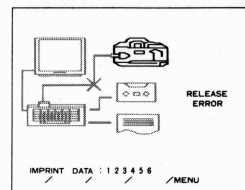
1. Push the F1 key to select the IMPRINT command on screen 12.
2. As the message "SET DATA" is displayed as in screen 13, set the imprint data you desire with the keys from 0 to 9, " " (blank), and "-" (hyphen) as in screen 14.
 - If you make a mistake in setting the data, use the **BS** key to delete the errors one at a time, then reset the data.
3. Push **RETURN**.



Screen 15



Screen 16

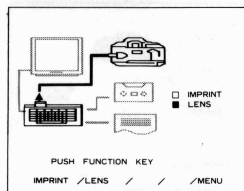


Screen 17

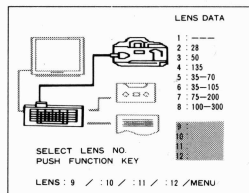
4. The computer will ask "DATA OK?", as in screen 15. If the data is correct, push the F1 key to select "YES", and screen 16 appears. If there is any mistake in the data, push F5 to select "NO", and reset the data on screen 13.
5. When screen 16 appears, push the F2 key to release the T90's shutter. By alternating the F1 and F2 keys, you can imprint the same data continuously on the film.

Notes:

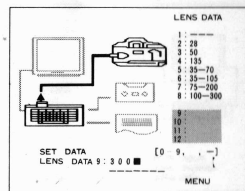
- If the Interface Unit D.M.B. and the Data Memory Back 90 attached to the T90 are not properly connected, the "X" mark will appear as in screen 17. If this is the case, please check the connections.
- When imprinting consecutive numbers, we recommend using Tape Software (accessory). For details about it, see page 34.



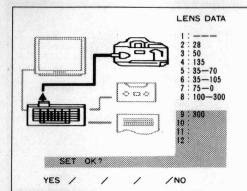
Screen 18



Screen 19



Screen 20

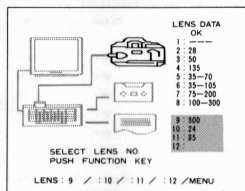


Screen 21

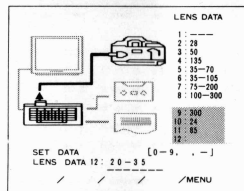
(B) LENS: inputting the lens data

In the Data Memory Back 90, 8 selectable lens data are already input. You can input new lens data as desired, up to an additional four types, with this command.

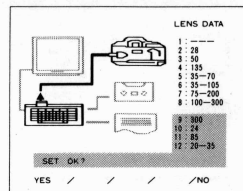
1. Select the LENS command using the F2 key on screen 18.
2. 8 types of lens data will appear, numbered from 1 to 8, on screen 19.
You can input new lens data from No. 9 to 12. According to the message "SELECT LENS NO.", push F1 to select the number 9.
3. When the message "SET DATA" appears, set the lens data with keys (screen 20), and push **RETURN**.
4. The computer will ask "SET OK?" as in screen 21. If you want to set other lens data from number 10 to 12, select "NO" with the F5 key, and operate keys following the same procedure as in steps 2 and 3 (screen 22, 23). If all setting is completed, select "YES" with the F1 key (screen 24), and the message "LENS DATA OK" appears as in screen 25.



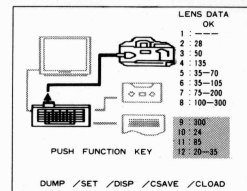
Screen 22



Screen 23



Screen 24



Screen 25

Note:

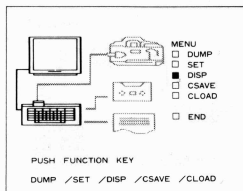
- The lens data that can be set includes up to seven characters including numbers from 0 to 9, "-" (hyphen), and blank spaces.

<Check the Input Lens Data>

Lens data input in the Interface Unit D.M.B. can be checked on the LCD panel of the Data Memory Back 90:

- Press the function selector of the Data Memory Back 90 to select the memory function ("R").
- Press the mode selector to select the lens data mode.
- You can check each setting for lens data by pressing and releasing the select button.

6. DISP



Screen 26

NO.	FR	TV	AV	DATE	TIME	METER
0067	1	250	5.6	85/10/25	12:21	SPOT
0068	2	125	8.0	85/10/25	12:25	SPOT
0069	3	60	11	85/10/25	12:28	SPOT
0070	4	90	5.6	85/10/25	13:40	SPOT
0071	5	60	8.0	85/10/25	13:45	AVER
0072	6	90	3.5	85/10/25	14:30	AVER

DPRINT /APRINT /SEARCH /1 FR /MENU

Screen 27

NO.	FR	ISO	+/-	FLASH	AE. MODE	LENS
0067	1	125		OFF	AV	35-70
0068	2	125		OFF	TV	35-70
0069	3	125		OFF	TV	35-70
0070	4	125		OFF	TV	35-70
0071	5	125		OFF	TV	50
0072	6	125		OFF	PROG	50

DPRINT /APRINT /SEARCH /1 FR /MENU

Screen 28

If the DISP command is selected from the MENU screen (Screen 26) or screen 25 with the F3 key, a part of the data for six frames will be displayed as in screen 27. You can see other data by moving the cursor with keys (screen 28). Under the last stored data, "END OF DATA" appears.

The DISP command has the following sub-commands:

- (1) DPRINT — prints out the six frames' data currently displayed on the screen by the MSX printer.
- (2) APRINT — prints out all the data stored in the MSX computer.
- (3) SEARCH — allows you to search the stored data on the screen. To search the data, three methods are available — No., FR., and COMMENT.

For further information, see page 17.

- (4) 1 FR — displays the detail data of one (one frame) frame.

- Furthermore, if you select the COMMENT command with the F1 key, you can input a comment of up to 15 characters for this data.
- Selecting the 6 FR command makes the screen display the data for six frames again.

- (5) MENU — return to MENU screen.

Note:

- With the DPRINT or APRINT command, use of spot metering or not is displayed when the data is printed out, although it cannot be seen on the screen.

7. SEARCH

SELECT SEARCH DATA

☒ NO
☐ FR
☐ COMMENT

NO /FR /COMMENT /DISP /MENU

Screen 29

SET SEARCH DATA

NO.

DATA : ☒ _ _ _ _

/ /SEARCH /DISP /MENU

Screen 30

SET SEARCH DATA

NO.

DATA : 7 2 ☒ _

/ /SEARCH /DISP /MENU

Screen 31

NO

DATA : 72

DATA OK?

YES / / / /NO

Screen 32

If you push the F3 key from screen 27, you will be able to search the stored data in the following three ways:

(1) NO. — searches for a particular 4-digit frame number.

1. Select the NO. command with the F1 key (screen 29).
2. When the message "SET SEARCH DATA" appears as shown in screen 30, set the frame number of the data you are searching for (screen 31), and then push **RETURN**.
3. The computer will ask "DATA OK?" as shown in screen 32. If the data is correct, select "YES" with F1.
 - If the data is not correct, select "NO" with the F5 key, and reset the data number on screen 30.

NO.	FR	TV	AV	DATE	TIME	METER -ING
0072	12	90	3.5	85/10/25	15:30	AVER
0073	13	125	4.0	85/10/25	15:32	AVER
0074	14	125	4.0	85/10/25	15:33	AVER
0075	15	250	3.5	85/10/25	15:33	AVER
0076	16	4,000	2.0	85/10/25	16:10	AVER
0076	17	2,000	4	85/10/25	16:12	AVER
NEXT SEARCH --> [RETURN]						
DPRINT /APRINT /SEARCH /1 FR /MENU						

Screen 33

NO.
DATA : 38
DATA IS NOT FOUND
/ /SEARCH /DISP /MENU

Screen 34

SELECT SEARCH DATA
☐ NO
☒ FR
☐ COMMENT
NO. /FR /COMMENT /DISP /MENU

Screen 35

SET SEARCH DATA
FR
DATA : 2
/ /SEARCH /DISP /MENU

Screen 36

- After the message "SEARCHING", the data for the six frames following the set number will be shown, as in screen 33.
- If there are several frames with the same number, push **RETURN** to display another frame with that number.

- When the number you have set is not in the computer, the message "DATA IS NOT FOUND" will appear (screen 34). If this is the case, select the SEARCH command with the F3 key and repeat the operation.

(2) FR. — searches for a particular exposure number.

- Select the FR. command with the F2 key. (Screen 35.)

FR
DATA : 2
DATA OK?
YES / / / /NO

Screen 37

NO.	FR	TV	AV	DATE	TIME	METER -ING
0162	2	1,000	4.5	85/10/30	10:20	AVER
0163	3	750	5.6	85/10/30	10:20	AVER
0164	4	500	5.6	85/10/30	10:20	AVER
0165	5	500	4.5	85/10/30	10:21	SPOT
0166	6	250	8.0	85/10/30	10:21	SPOT
0167	7	250	9.5	85/10/30	10:25	SPOT
NEXT SEARCH --> [RETURN]						
DPRINT/APRINT /SEARCH /1 FR /MENU						

Screen 38

- When the message "SET SEARCH DATA" appears, set the exposure number of the data you wish to find (screen 36) and then push **RETURN**.
- The computer will ask "DATA OK?" as shown in screen 37. If the data is correct, select "YES" with the F1 key.
- After the message "SEARCHING", the data for the six frames following the set exposure number appear, as shown in screen 38.

```

SELECT SEARCH DATA
☐ NO
☐ FR
☒ COMMENT

NO /FR /COMMENT /DISP /MENU

```

Screen 39

```

SET SEARCH DATA
COMMENT
DATA : portrait 3 ■

```

Screen 40

```

COMMENT
DATA : PD portrait 3
DATA OK ?

YES / / / /NO

```

Screen 41

```

NO : 1057 DATE 85/11/20 TIME 15:33
FR 22 :
TV : 500 AE-MODE: PROG
AV : 4.0 METERING: AVER
ISO : 200 FLASH : OFF
+/- : --- LENS : 35-70

COMMENT : portrait 3

NEXT SEARCH --> [RETURN]
COMMENT/PRINT /SEARCH /6 FR /MENU

```

Screen 42

5. If there are several frames with the same exposure number, push **[RETURN]** to display another frame with that number.

(3) COMMENT — searches for a particular comment.

1. Select COMMENT with the F3 key on screen 39.
2. When the message "SET SEARCH DATA" appears, set the comment you want to search for (screen 40), and then push **[RETURN]**.
3. The computer will ask "DATA OK?" as shown in screen 41. If the data is correct, select "YES" with the F1 key.
4. After the message "SEARCHING", the detailed data with the indicated comment will be displayed as screen 42.
If there are several frames with the same comment, push **[RETURN]** to display another frame with that comment.

```

NO : 1057 DATE 85/11/20 TIME 15:33
FR : 22
TV : 500 AE-MODE: PROG
AV : 4.0 METERING: AVER
ISO : 200 FLASH : OFF
+/- : --- LENS : 35-70

COMMENT :

COMMENT /PRINT /SEARCH /6 FR /MENU

```

Screen 43

```

NO : 0073 DATE 85/10/25 TIME 12:21
FR : 13
TV : 500 AE-MODE: PROG
AV : 4.0 METERING: AVER
ISO : 200 FLASH : OFF
+/- : --- LENS : 35-70

COMMENT :
COMMENT : portrait 3 ■

COMMENT /PRINT /SEARCH /6 FR /MENU

```

Screen 44

```

NO : 0073 DATE 85/10/25 TIME 12:21
FR : 13
TV : 800 500 AE-MODE: PROG
AV : 4.0 METERING: AVER
ISO : 200 FLASH : OFF
+/- : --- LENS : 35-70

COMMENT : portrait 3

COMMENT /PRINT /SERCH /6 FR /MENU

```

Screen 45

< Input the Comment >

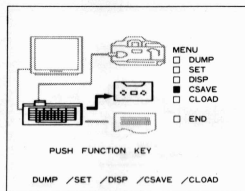
To add a comment to the other data for a frame, operate as follows:

1. Select the COMMENT command with the F1 key on screen 43.
2. You can input up to a 15-character comment using the character keys. (screen 44.)
3. 44.)

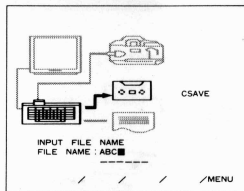
Push **RETURN**.

- If you select the PRINT command on screen 45, the data currently displayed on the screen will be printed out.

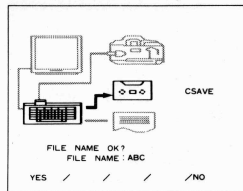
8.CSAVE



Screen 46



Screen 47

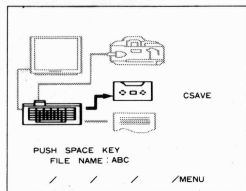


Screen 48

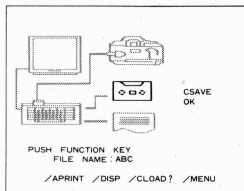
With this command, you can store the data, which was transmitted to the MSX computer from the Data Memory Back 90 under the DUMP command, to the cassette tape.

1. On the MENU screen 46, select the CSAVE command with the F4 key.
2. Set the file name with the keyboard, up to 6 characters (screen 47). You can use alphabet characters or numbers.
3. Check that the file name is correct, then push **RETURN**.
 - If you make a mistake, delete the error with the **BS** key.

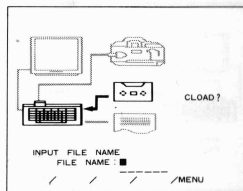
4. The computer will ask "FILE NAME OK?" as shown in screen 48. If the name is correct, select "YES" with F1 key.
 - If the name is not correct, select "NO" and set the file name again.



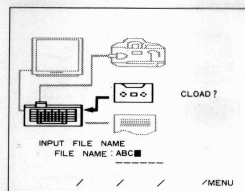
Screen 49



Screen 50



Screen 51

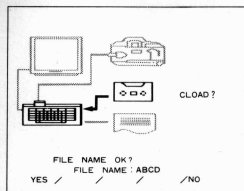


Screen 52

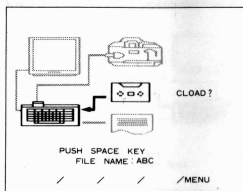
5. After checking that the cassette recorder is properly connected and that the cassette tape is in the recorder, make the recorder ready for recording, and then push the space key as indicated in screen 49.
Recording the data onto the tape begins.
6. When storing is completed, "CSAVE OK" is displayed as shown in screen 50, and the cassette recorder stops automatically.
 - It takes about three minutes to store the data regardless of the amount.

< Check the exposure data stored on the cassette tape >

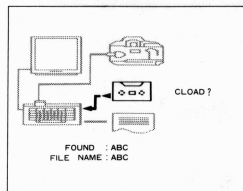
1. Rewind the tape to the position where you began saving data.
 - It is impossible to rewind the tape if the pin jack is plugged into the remote jack. First remove this jack.
2. Set up the cassette recorder to play back.
3. Push the F4 key to select "CLOAD?" on screen 50, and screen 51 appears.



Screen 53

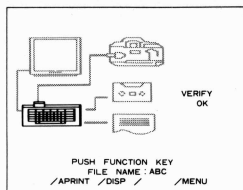


Screen 54

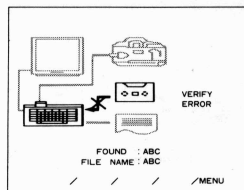


Screen 55

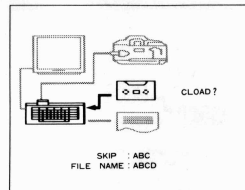
4. Input the file name you have stored (screen 52), and push **RETURN**.
5. The computer will ask "FILE NAME OK?" as shown in screen 53.
If the name is correct, select "YES" using the F1 key. Otherwise, select "NO" using the F5 key, and set the name again.
6. Push the space key so that CLOAD? executes from screen 54. The computer begins checking the data on the cassette tape.
7. When the computer finds the exposure data corresponding to the file name you input, the message "FOUND: (file name)" appears as shown in screen 55.



Screen 56



Screen 57



Screen 58

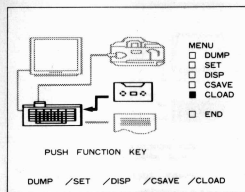
8. When the computer finishes reading all the exposure data from the cassette tape, it displays the message "VERIFY OK". This verifies that the exposure data is stored in the cassette tape (screen 56).

- If the data is not properly stored, the computer will display an X symbol and the message "VERIFY ERROR" (screen 57). In this case, repeat the CSAVE operation.

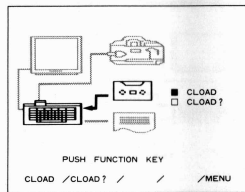
Notes:

- If the file name set in step 4 is not correct, the actually stored file name is displayed as shown in screen 58.

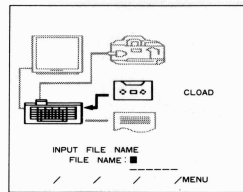
9.CLOAD



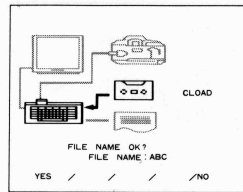
Screen 59



Screen 60



Screen 61



Screen 62

With this command, the computer reads exposure data stored on the cassette tape. This command has two forms:

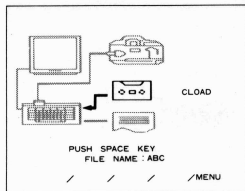
“CLOAD” command reads the exposure data stored on the tape into your MSX computer.

“CLOAD?” command reads the stored data immediately after you execute “CSAVE”, enabling you to compare the stored data with the contents of “CSAVE” to make sure that the data has been stored correctly.

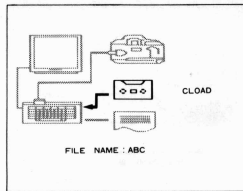
(1) CLOAD

1. Select “CLOAD” with the F5 key of the MENU screen (screen 59). On the next screen (screen 60), select “CLOAD” with the F1 key.
2. After the message “INPUT FILE NAME” appears on screen 61, set the file name and push **RETURN**.
3. The computer will ask “FILE NAME OK?”.

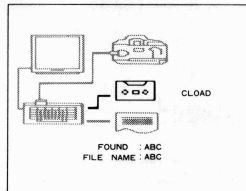
If the name is correct, select “YES” with key F1.



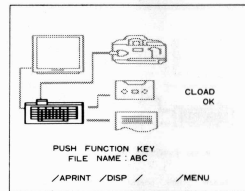
Screen 63



Screen 64



Screen 65



Screen 66

4. Push the space key as indicated on screen 63. The computer begins reading the data from the cassette tape. (Screen 64.)
5. When the computer finds the exposure data corresponding to the file name you input, it first displays the message "FOUND: (file name)" (Screen 65.)
6. When the computer finishes reading the exposure data from the cassette tape, "CLOAD OK" is displayed. (Screen 66.)
 - It takes about three minutes to read the exposure data regardless of the amount of stored data.

(2) CLOAD?

For details about the operation of CLOAD?, refer to page 22.

TAPE SOFTWARE

1. Programs

The Tape Software has the following programs:

1. PROGRAM-1

A) **TIMER function** — controls the camera with

1) Self-timer mode:

The shutter is released once after a fixed period of time. The self-timer can be set in 1-sec. units to any interval from 1 sec. to 99 hrs., 59 mins., 59 secs.

2) Interval timer mode:

The shutter is released at fixed intervals. The interval timer can be set in 1-sec. units to any value from 3 secs. to 99 hrs., 59 mins., 59 secs.

3) Long release timer mode:

The shutter is released and held open for a fixed interval. The long release timer mode can be set in 1-sec. units to any value from 3 secs. to 99 hrs., 59 mins., 59 secs.

4) Number of exposures made mode:

The number of exposures to be made can be set from 1 frame to 99 frames.

Combining all modes of the timer control function is possible.

B) **IMPRINT function**

— imprints the data on the film when releasing the shutter with the keyboard.

Any six-digit number which is input before shooting can be imprinted on the film for 50 frames by pushing the key to release the shutter.

Numbers from 0 to 9, blanks, and hyphens can be used.

2) **PROGRAM-2**

With this program, you can manually input the exposure data for 144 frames. The data, once stored in the MSX personal computer, can then be transferred onto a cassette tape using the CSAVE command, and can also be printed out.

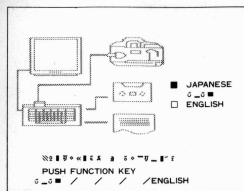
The items that can be input are the same as those of the reduced capacity mode.

Connecting the unit

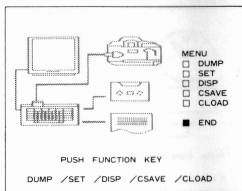
For information concerning connecting the MSX personal computer to a monitor TV, printer or cassette recorder, refer to each instruction booklet.

The Tape Software's program is programmed in BASIC. Therefore, you can easily change the program as desired.

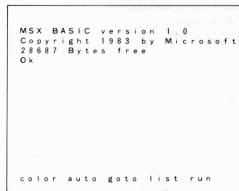
2.Executing PROGRAM-1



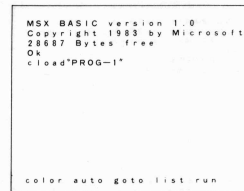
Screen 67



Screen 68



Screen 69



Screen 70

1. Connect the Interface Unit D.M.B. and the cassette recorder to the MSX computer as you execute CLOAD and CSAVE commands, and then turn on the main power.
2. Insert the Tape Software cassette into the recorder and rewind the tape to the first position.
 - The Tape Software has the same programs on both A and B sides. You can use either side.
3. Select English program with the F5 key on screen 67.
4. Select the "END" command by moving the cursor down (screen 68), and push **RETURN**.
5. The screen for the END program appears (screen 69).
6. Type **cload"PROGRAM-1"** to load PROGRAM-1 (screen 70).
 - PROG must be in capital letters.
 - If you make a mistake, move the cursor to that letter and re-type it.

```

MSX BASIC version 1.0
Copyright 1983 by Microsoft
28687 Bytes free
Ok
cload"PROG-1"
Found:PROG-1

```

color auto goto list run

Screen 71

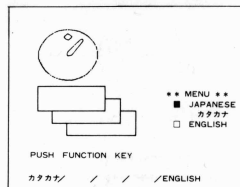
```

MSX BASIC version 1.0
Copyright 1983 by Microsoft
28687 Bytes free
Ok
cload"PROG-1"
Found:PROG-1
Ok

```

color auto goto list run

Screen 72



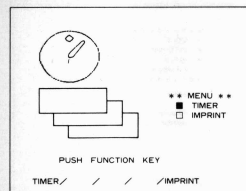
Screen 73

7. Set the volume control of the tape recorder to a high position, and press the PLAY button.
8. Push **RETURN**. The recorder should begin to play.
9. When the computer finds PROGRAM-1 of the Tape Software, "Found: PROG-1" will appear as in screen 71.
10. Wait until "OK" appears on the screen (screen 72), which indicates that the loading is completed.
11. Select "run" at the bottom right of the screen with the F5 key to execute the program. Screen 73 will appear.
12. Select ENGLISH program with the F5 key. MENU screen (screen 74) will appear.
13. On this MENU screen you can select either the TIMER or IMPRINT function.

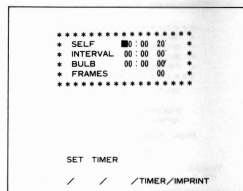
Note:

- To load the program from the Tape Software, the END command must be first executed on the MENU screen (screen 68). Even if CLOAD is selected, this program cannot be loaded.

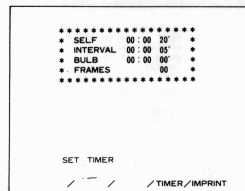
(A) TIMER function



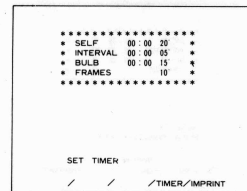
Screen 74



Screen 75



Screen 76

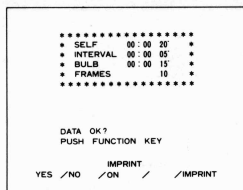


Screen 77

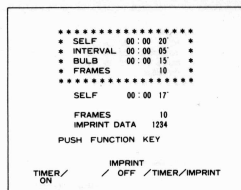
The self-timer can be set from 1 sec. to 99 hrs., 59 mins., 59 secs. The interval timer and the long release timer mode can be set from 3 secs. to 99 hrs., 59 mins., 59 secs. The number of exposures to be made can be set from 1 to 99 frames. Furthermore, combining all modes of the timer control function is possible.

1. Select the TIMER function with the F1 key on screen 74.
2. Set the self-timer (SELF) as you wish, with the numeral keys, and push **RETURN**.
3. The cursor will move down to the interval timer mode. Set the interval timer (INTERVAL), long release timer (BULB) and number of exposures to be made (FRAMES) following the same procedure as in step 2 (screens 75, 76 and 77).

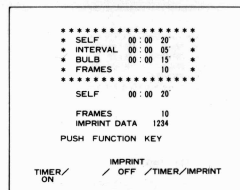
- The interval timer and long release timer must be set to more than two seconds, or else the cursor doesn't move down when **RETURN** is pressed.



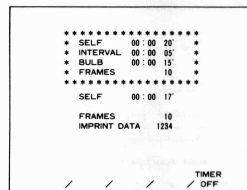
Screen 78



Screen 79



Screen 80



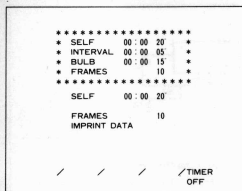
Screen 81

4. After the number setting is complete and **RETURN** is pressed, the message "DATA OK?" will appear, as shown in screen 78. If the setting is correct, select "YES" with the F1 key. If there is some error, select "NO" with the F2 key, and correct the mistake.

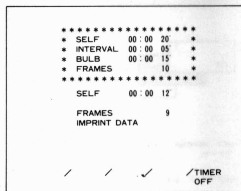
Notes:

- The number of exposures to be made must be set in any case, or the timer will not function.
- Once **RETURN** is pressed, the cursor will no longer move up. If you want to change the number after pressing **RETURN**, please reset that number after selecting "NO" in step 4.
- If the imprinting data has been set in the IMPRINT function, select IMPRINT ON with the F3 key. The imprinting data will be displayed as in screen 79. (For details about the IMPRINT function, see page 34.)

5. To start the timer-control function, select **TIMER ON** with the F1 key. When the timer-control function works, the mode in use is displayed under the dot frame. Setting time decrements by one second. Number of exposures to be made decrements by one frame as the shutter button is released.



Screen 82

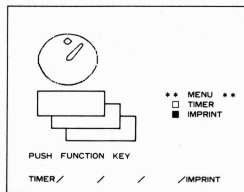


Screen 83

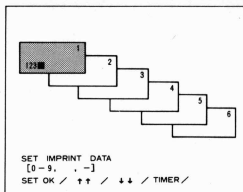
Notes:

- The shutter must be released with the F1 key of the computer.
- To set the timer-control function, set the T90 to continuous shooting mode.
- Do not set the self-timer on the camera itself when the self-timer mode is used.
- "BULB" must be set on the camera when using the long release timer mode.
- When the long release timer mode is set with the Tape Software program, flash cannot be used.
- When the data function is set on the Data Memory Back 90, ("R, D" or "D"), the imprinting data will be displayed on the LCD panel.
- To stop executing the timer modes, select "TIMER OFF" with the F5 key.

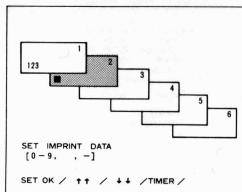
(B) IMPRINT function



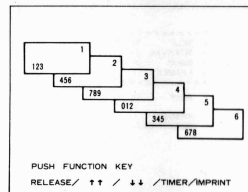
Screen 84



Screen 85



Screen 86



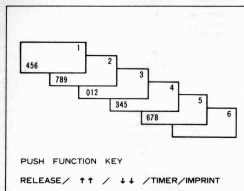
Screen 87

1. Select the IMPRINT command with the F5 key from screen 84.
2. The first frame will be red (screen 85). The red frame indicates that you can input the data to be imprinted.
3. Input numbers you wish to imprint on the film (screen 85). Then press **RETURN**.
 - The numbers from 0 to 9, blanks, and hyphens can be used.
4. When the second frame becomes red (screen 86), set numbers as you desire, then push **RETURN**.

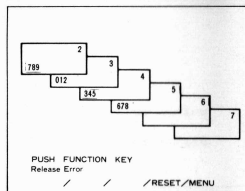
You can input numbers for up to 50 frames in this manner.

 - ↑↑/↓↓ arrows at the bottom of the screen indicate that the screen changes by 6 frames, forward or backward, when pushed.
5. When number setting is all completed, select SET OK with the F1 key on screen 86.

6. When you push the F1 key to select RELEASE on screen 87, the shutter of the T90 is released at the same time, and the data is imprinted on the film.
 - After each exposure the next frame to be imprinted moves left one by one (screen 88).
 - If the Data Memory Back 90 is not properly connected, the message "RELEASE ERROR" appears as shown in screen 89. In this case, check the connection of the Data Memory Back and the Interface Unit, select RESET with the F4 key, and then release again.



Screen 88



Screen 89

- Select RELEASE after six frame numbers are all displayed on the screen. Otherwise, the shutter cannot be released.
- To correct the number to be imprinted, select IMPRINT with the F5 key. The cursor moves back to the first frame so you can reset numbers.

When using the Tape Software, the IMPRINT function of the tape is prior to the functions of the Data Memory Back 90.

The display on the Data Memory Back 90's LCD panel and functions are as follows:

Function of the Data Memory Back 90 \ Tape Software	When the IMPRINT function is executed	When the IMPRINT function is not executed
R, D	R, D	R
OFF	D	OFF
D	D	OFF
R	R, D	R

3.Executing PROGRAM-2

```
MSX BASIC version 1.0
Copyright 1983 by Microsoft
28687 Bytes free
Ok
cloud "PROG-2" ■

color auto goto list run
```

Screen 90

```
MSX BASIC version 1.0
Copyright 1983 by Microsoft
28687 Bytes free
Ok
cloud "PROG-2"
Found: PROG-2
Ok
■

color auto goto list run
```

Screen 91

```
[F1] --- JAPANESE
      0_0 ■
[F5] --- ENGLISH
```

Screen 92

```
DATA NO : 144
COUNTER : 1
FRAME : 1
TV : 125
AV : 5 6

COMMENT :

[F1] --- COUNTER SET
[F2] --- FRAME SET
[F3] --- COMMENT SET
[F4] --- DATA CORRECTION
[F5] --- DATA SAVE

[SPACE] --- DATA SET
```

Screen 93

With this program, you can input into the Data Memory Back 90 the exposure data for 144 frames that you have recorded elsewhere. The input data can be printed out with an MSX printer, or stored on a cassette tape.

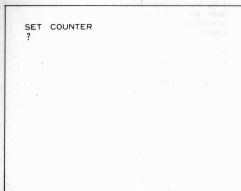
- To execute PROGRAM-2 after executing PROGRAM-1, the computer must be turned off in between.

1. Type **cloud**“**PROG-2**” to load PROGRAM-2 (screen 90), and push **RETURN** to play the recorder.
2. When the computer finds PROGRAM-2, “Found: PROGRAM-2” will appear. When the loading is completed, “OK” will appear (screen 91).

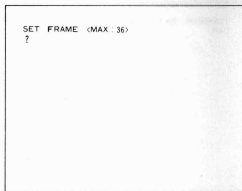
3. Select “run” with the F5 key to execute the program, and screen 92 appears.
4. Select ENGLISH program with the F5 key.
5. After the message “WAIT”, screen 93 will appear.

DATA NO. 144 means that you can input the exposure data for 144 frames.

You can input counter number, frame number, shutter speed, aperture value, and comment.



Screen 94



Screen 95

- ① Setting the shutter speed and aperture value:

On the screen, 125 (= the shutter speed of 1/125 sec.) and 5.6 (= the aperture value of f/5.6) are already displayed. You can change the data with the cursor keys.

Push the  or  key to set the shutter speed.

Push  or  to set the aperture value.

- ② Setting the counter number:

Push the F1 key to set the counter number, and the message "SET COUNTER" appears as in screen 94. You can input any number from 1 to 9999. Then push **RETURN**.

- ③ Setting the frame number:

Push the F2 key to set the frame number. When the message "SET FRAME <MAX 36>" appears as in screen 95, set the number from 1 to 36 with the keys, and push **RETURN**.

- ④ Setting the comment:

Push the F3 key to set the comment. For details, see page 38.

- ⑤ Inputting the data:

Push the space key to input the data.

The DATA NO. will become 143.

The COUNTER and FRAME numbers count up by one.

Input all data you desire following these procedures.

- ⑥ Correcting the data:

If you want to correct any data, push the F4 key, and the data for the previous frame is displayed. After correcting the data, push the space key to input the new data.

- ⑦ Saving the data:

Push the F5 key to save the data. See page 39.

4. Setting the Comment

DATA NO : 144
COUNTER : 1
FRAME : 1
TV : 125
AV : 5.6

COMMENT :

[F1] ---- COUNTER SET
[F2] ---- FRAME SET
[F3] ---- COMMENT SET
[F4] ---- DATA CORRECTION
[F5] ---- DATA SAVE
[SPACE] ---- DATA SET

Screen 96

SET COMMENT (MAX 15)
CAR

Screen 97

COMMENT OK? (y/n)
CAR

Screen 98

DATA NO : 144
COUNTER : 1
FRAME : 1
TV : 125
AV : 5.6

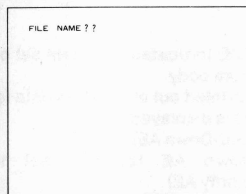
COMMENT : CAR

[F1] ---- COUNTER SET
[F2] ---- FRAME SET
[F3] ---- COMMENT SET
[F4] ---- DATA CORRECTION
[F5] ---- DATA SAVE
[SPACE] ---- DATA SET

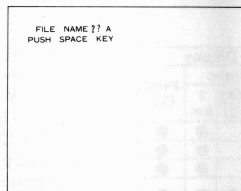
Screen 99

1. Select COMMENT SET with the F3 key on screen 96.
2. Set the comment, up to 15 characters, and push **RETURN** (screen 97).
3. The computer will ask "COMMENT OK? <y/n>" as in screen 98. If it is correct, push **Y**. Screen 99 will appear with the comment. If it is not correct, select **N** and reset the comment.

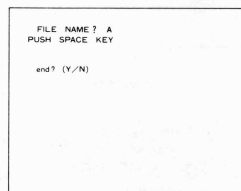
5. Saving the Data



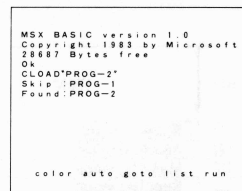
Screen 100



Screen 101



Screen 102



Screen 103

To save the data you have input, remove the Tape Software and insert an ordinary cassette tape into the recorder.

1. Select DATA SAVE with the F5 key on screen 99.
2. The computer will ask "FILE NAME??" as in screen 100. Set the file name, up to 6 characters, and push **RETURN**.
3. Make the recorder ready for recording.
4. Push the space key as indicated in screen 101 to save the data on the cassette.
5. When saving is completed, the computer will ask "end ? <y/n>" as in screen 102, and if it is OK, select the **Y** key. OK will appear on the screen.

For loading the data saved on the cassette, refer to page 25 about CLOAD.

Notes:

- When the exposure data is saved on a cassette under PROGRAM-2, you cannot check whether it is properly stored or not under the CLOAD? command.
- When loading PROGRAM-2 from the first position of the tape, "Skip: PROG-1" will appear on the screen. Wait until "Found: PROG-2" appears as in screen 103.

6. Stored Exposure Data

NO.	ITEM	CONTENTS	Display			
			Screen		1 frm	Print Out
			6 frames (1)	(2)		
(1)	Shutter speed	numeral, BULB	●		●	●
(2)	Aperture value	numeral, M, SDA, SDM	●		●	●
(3)	Metering mode	AVER, SPOT, PART	●		●	●
(4)	Shooting mode	AE-MODE: TV			●	●
	1) Shutter-priority AE	AE-MODE: AV			●	●
	2) Aperture-priority AE	AE-MODE: PROG			●	●
*-1	3) Program AE	AE-MODE: PROG			●	●
*-1	4) A-TTL mode	FLASH: A-TTL			●	●
	5) FE lock mode	FLASH: FEL			●	●
*-1	6) TTL mode	FLASH: TTL			●	●
*-1	7) New-CATS, program New-CATS	FLASH: CATS			●	●
*-1	8) Manual flash	FLASH: M			●	●
(5)	Use flash or not	Yes: A-TTL, FEL, TTL, CATS, M No: OFF			●	●
(6)	Stopped-down mode	AV: SDA, SDM	●		●	●
(7)	Spot metering data	SPOT DATA (up to 8 displays)			●	●*-2
(8)	FE lock data	FEL DATA, EVR			●	●*-2
(9)	Use exposure compensation or not	Yes: numeral No: no display			●	●
(10)	Amount of exposure compensation	numeral			●	●
(11)	Number of exposures	numeral	●		●	●
(12)	ISO film speed	numeral			●	●
(13)	Use manual exposure (or not)	AV: M	●		●	●
(14)	4-digit frame number	numeral	●		●	●
(15)	Auto calendar	date, time	●		●	●
(16)	Type of lens in use (manual set)	numeral, - - -			●	●

*-1: AE-MODE indicates the mode set on the camera body.

*-2: Will be printed out even when data for 6 frames is displayed.

SDA (Stopped-Down AE):

Stopped-down AE (camera set to aperture-priority AE)

SDM (Stopped-Down Manual):

Stopped-down metering (the camera set to shutter-priority AE)

EVR (Exposure Value Reference):
number of control steps

Note:

The spot metering data, FE lock data and amount of exposure compensation are not displayed on the LCD panel of the Data Memory Back 90.

7. Print-out Examples

		(2) Aperture value			(15) Auto calendar		(12) ISO film speed	(9) Use exposure compensation		(10) Amount of exposure compensation	(5) Use flash or not	(4) Shooting mode	(3) Metering mode	(16) Lens data in use
(11) Number of exposures	(14) 4-digit frame number	NO.	FR	TV	AV	DATE	TIME	ISO	+/-	FLASH	AE-MODE	METER-ING	LENS	
		0660	1	4000	1.2	85/10/29	1:43	400		OFF	TV	AVER	28	
		0661	2	4000	1.2	85/10/29	1:43	400		OFF	TV	SPOT	28	
						SPOT DATA	1:-	3/4						
		0662	3	1000	2.8	85/10/29	1:44	400		OFF	TV	PART	28	
		0663	4	750	1.2	85/10/29	1:44	400		OFF	TV	PART	28	
		0664	5	250	1.8	85/10/29	1:45	400		OFF	TV	PART	28	
(13) Use manual exposure or not		0665	6	1"	M	85/10/29	1:45	400		OFF	TV	PART	28	
		0666	7	30"	M	85/10/29	1:46	400		OFF	TV	AVER	28	
		0667	8	180	SDM	85/10/29	1:47	400		OFF	TV	AVER	28	
		0668	9	180	2.5	85/10/29	1:50	400		OFF	TV	AVER	50	
(6) Stopped-down mode		0669	10	125	5.6	85/10/29	1:52	400		OFF	AV	AVER	50	
		0670	11	4"	32	85/10/29	1:52	100	-2/3	OFF	AV	AVER	50	
		0671	12	4	32	85/10/29	1:52	100	-1 2/3	OFF	AV	AVER	50	
		0672	13	180	1.2	85/10/29	1:52	100	1/3	OFF	AV	AVER	50	
		0673	14	60	1.2	85/10/29	1:52	100	2	OFF	AV	AVER	50	
		0674	15	10	SDA	85/10/29	1:55	100		OFF	AV	AVER	135	
		0675	16	180	M	85/10/29	1:56	100		OFF	AV	PART	135	
		0676	17	125	4.0	85/10/29	1:56	100		OFF	PROG	SPOT	135	
(7) Spot metering data		0677	18	10	SDA	SPOT DATA	1:-	1/4						
		0678	19	10	SDA	SPOT DATA	1:-	1/4			OFF	PROG	AVER	135
		0679	20	180	4.5	85/10/29	1:59	100			OFF	PROG	AVER	35-70
		0680	21	BULB	32	85/10/29	1:59	1600			OFF	BULB	AVER	35-70
		0681	22	BULB	SDM	85/10/29	1:59	1600			OFF	BULB	PART	35-70
		0685	26	4000	2.0									
		0686	27	250	1.2									
		0687	28	15	4.5	85/10/29	2:06	100		ATTL	TV	AVER	75-200	
(8) FE lock data		0688	29	60	4.0	85/10/29	2:07	100		FEL	PROG	SPOT	75-200	
						FEL DATA: +/-	0	EVR: - 2	1/4					
		0696	1	60	4.0	85/10/29	2:08	100		FEL	PROG	SPOT	75-200	

Programs built into the Interface Unit D.M.B.:

1. Program for reading data stored in the Data Memory Back 90 into an MSX personal computer.
2. Program for sending the following three types of data from the MSX personal computer to the Data Memory Back 90
 - 1) Data to be recorded on film
 - 2) Lens data
 - 3) Shutter release control signal
3. Program for retrieving data on any exposure from that transferred to the MSX personal computer and displaying it on the computer's CRT screen.
4. Program for printing all data sent to the MSX personal computer.
5. Program for recording data sent to the MSX personal computer on any ordinary cassette tape.
6. Program for loading data recorded on tape back into the MSX personal computer.

Connection:

1. Data Memory Back 90 is connected to the Interface Unit D.M.B. through a connecting cord (80 cm long) and 6-pin connector.
2. The Interface Unit D.M.B. itself plugs into the cartridge slot in the MSX personal computer.

Dimensions: 109(W) × 120(H) × 18(D) mm
(4-5/16" × 4-3/4" × 11/16")

Weight: 160 g (5-5/8 ozs.)

Subject to change without notice.

Interface Unit D.M.B., MSX computer and Data Memory Back 90 are not available in North America and some other areas.

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